

DVP04TC-S Thermocouple Sensors

Instruction Sheet

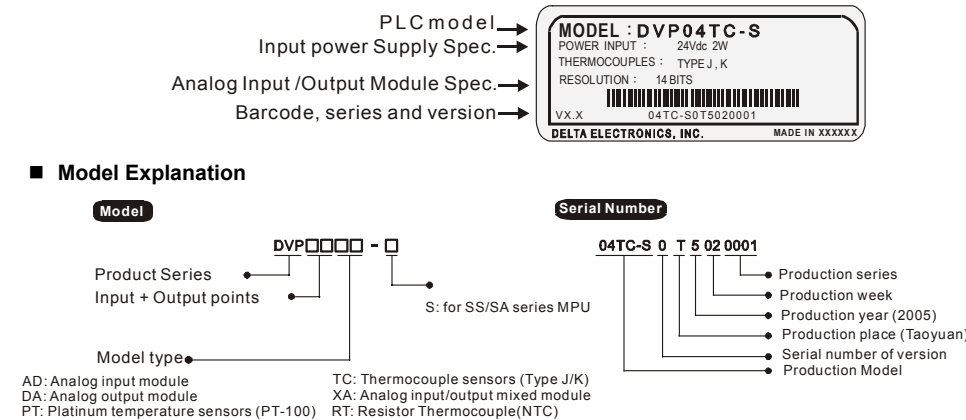
1 WARNING

- Always read this instruction thoroughly before using the DVP04TC-S.
- Make sure that power is OFF before wiring.
- This is an OPEN TYPE PLC. The PLC should be kept in an enclosure away from airborne dust, humidity, electric shock risk and vibration. Also, it is equipped with protective methods such as some special tools or keys to open the enclosure, in order to prevent hazard to users or damage the PLC.
- Do NOT connect the AC main circuit power supply to any of the input/output terminals, or it may damage the PLC. Check all the wiring prior to power up.
- Do NOT touch internal circuit within 1 minute after power is OFF.
- Make sure that the DVP04TC-S is properly grounded \oplus , to avoid any electromagnetic noise.

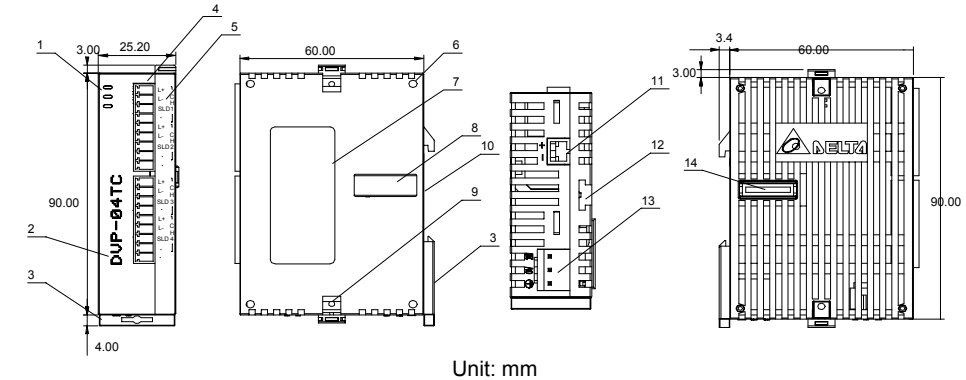
2 INTRODUCTION

2.1 Model Explanation and Peripherals

- Thank you for choosing DELTA's DVP Series PLC. The DVP04TC-S allows the connection of four thermocouple sensors (Type J/K). The DVP04TC-S series can read/write the data by using instructions FROM / TO via DVP-PLC SS/SA/SX/SC MPU program. There are 49 CR (Control Register) in each module and 16 bits for each register.
- DVP04TC-S thermocouple sensor can update software version by RS-485. Power supply and main processing units are sold separately.
- The DVP04TC-S works with both Centigrade and Fahrenheit. The input resolution for Centigrade is 0.1 degrees and for Fahrenheit is 0.18 degrees.
- Nameplate Explanation

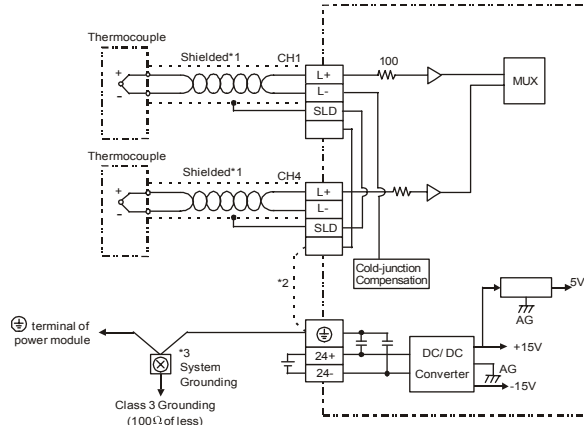


2.2 Product Profile and Outline



1. Status indicator (Power, RUN and ERROR)	8. Extension port
2. Model Number	9. Extension Clip
3. DIN rail clip	10. DIN rail location (35mm)
4. I/O terminals	11. RS-485 Communication port
5. I/O point indicator	12. Extension Clip
6. Extension hole of the extension unit mounting pins	13. DC Power input
7. Specification Label	14. Extension port

2.3 External wiring



Note 1: Use only the wires that are supplied with your thermocouple sensor. Tighten PLC terminal screws to a torque of 1.95 kg-cm (1.7 in-lbs).

Note 2: Terminal SLD is a grounding location for noise suppression.

Note 3: Please connect \oplus terminal of power supply module and \oplus terminal of DVP04TC-S thermocouple sensors module to system earth ground.

Warning: DO NOT connect wires to the No Connection (●) terminals. Use copper conductor only. 60°C

2.4 Terminals of analog module

DVP04AD-S	DVP02DA-S	DVP04DA-S	DVP04PT-S	DVP04TC-S	DVP06XA-S	DVP08RT-S
DVP-04AD	DVP-02DA	DVP-04DA	DVP-04PT	DVP-04TC	DVP-06XA	DVP-08RT

3 STANDARD SPECIFICATIONS

3.1 Function Specifications

Platinum Temperature Module (04TC)	Centigrade (°C)	Fahrenheit (°F)
Power Supply Voltage	24 VDC(20.4VDC~28.8VDC) (-15%~+20%)	
Analog Input Channel	4 channels per module	
Sensors Type	J-type or K-type thermocouple	
Temperature Input Range	J-type: -100°C~700°C K-type: -100°C~1000°C	J-type: -148°F~1292°F K-type: -148°F~1832°F
Digital Conversion Range	J-type: K-1000~K7000 K-type: K-1000~K10000	J-type: K-3280~K12920 K-type: K-1480~K18320
Resolution	14 bits(0.1°C)	14 bits(0.18°F)
Overall Accuracy	±0.5% of full scale of 25°C(77°F), ±1% of full scale during 0~55°C (32~131°F)	
Response Time	250 ms × channels	
Isolation Method	Isolation between digital and analog circuitry. There is no isolation between channels.	
Digital Data Format	2's complement of 16-bit, (13 Significant Bits)	
Average Function	Yes (CR#2~CR#5 may be set and the range is K1~K4096)	
Self Diagnostic Function	Yes	
Communication Mode (RS-485)	MODBUS ASCII/RTU Mode. Communication baud rate of 4800 / 9600 / 19200 / 38400 / 57600 / 115200. For ASCII mode, date format is 7Bits, even, 1 stop bit (7 E 1). For RTU mode, date format is 8Bits, even, 1 stop bit (8 E 1). The RS-485 is disabled when the DVP04TC-S is connected in series to an MPU.	
Connection to a DVP-PLC MPU in Series	When DVP04TC-S modules are connected to an MPU, the modules are numbered from 0 ~ 7. 0 is the closest to the MPU and 7 is the farthest. The Maximum number of modules is 8 modules and they do not occupy any digital I/O points of the MPU.	

3.2 Other Specification

Power Specification	
Maximum Power Consumption	2W at 24 VDC (20.4VDC~28.8VDC) (-15 % ~ +20 %)
Environment Condition	
Environment Condition	Follow the DVP-PLC MPU.
Static Electricity Prevention	All places between terminals and ground comply with the spec.

4 CR (Control Register)

DVP04TC-S platinum temperature sensors				Explanation																				
CR No.	RS-485 Parameter address	Latched	Register name	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0					
#0	H 4096	<input type="radio"/>	R	Model type			System used, DVP04TC-S model code = H 8B																	
#1	H 4097	<input type="radio"/>	R/W	Thermocouple type	Reserved				CH4				CH3				CH2				CH1			
					Example: Setting of CH1																			
					1. b0: set 0 to use J-type and set 1 to use K-type																			
					2. b1: Reserved. 3. b2: Reserved.																			
#2	H 4098	<input type="radio"/>	R/W	CH1 average number																				
#3	H 4099	<input type="radio"/>	R/W	CH2 average number																				
#4	H 409A	<input type="radio"/>	R/W	CH3 average number																				
#5	H 409B	<input type="radio"/>	R/W	CH4 average number																				
#6	H 409C	<input checked="" type="radio"/>	R	CH1 average degrees(C)			Average degrees for channels CH1~CH4. (unit: 0.1 degrees C)																	
#7	H 409D	<input checked="" type="radio"/>	R	CH2 average degrees(C)																				
#8	H 409E	<input checked="" type="radio"/>	R	CH3 average degrees(C)																				
#9	H 409F	<input checked="" type="radio"/>	R	CH4 average degrees(C)																				
#10	H 40A2	<input checked="" type="radio"/>	R	CH1 average degrees(F)			Average degrees for channels CH1~CH4. (unit: 0.1 degrees F)																	
#11	H 40A3	<input checked="" type="radio"/>	R	CH2 average degrees(F)																				
#12	H 40A4	<input checked="" type="radio"/>	R	CH3 average degrees(F)																				
#13	H 40A5	<input checked="" type="radio"/>	R	CH4 average degrees(F)																				
#14	H 40A8	<input checked="" type="radio"/>	R	Present temperature of CH1 (C)			Present temperature of channels CH1~CH4. (unit: 0.1 degrees C)																	
#15	H 40A9	<input checked="" type="radio"/>	R	Present temperature of CH2 (C)																				
#16	H 40AA	<input checked="" type="radio"/>	R	Present temperature of CH3 (C)																				
#17	H 40AB	<input checked="" type="radio"/>	R	Present temperature of CH4 (C)																				
#18				Reserved																				
#19	H 40AE	<input checked="" type="radio"/>	R	Present temperature of CH1 (F)			Present temperature of channels CH1~CH4. (unit: 0.1degrees F)																	
#20	H 40AF	<input checked="" type="radio"/>	R	Present temperature of CH2 (F)																				
#21	H 40B0	<input checked="" type="radio"/>	R	Present temperature of CH3 (F)																				
#22	H 40B1	<input checked="" type="radio"/>	R	Present temperature of CH4 (F)																				
#23				Reserved																				
#24	H 40AE	<input type="radio"/>	R	CH1 OFFSET Value			Adjust offset value of channels CH1~CH4. The range is -1000~+1000 and factory setting is K0. (unit: 0.1 degrees C)																	
#25	H 40AF	<input type="radio"/>	R	CH2 OFFSET Value																				
#26	H 40B0	<input type="radio"/>	R	CH3 OFFSET Value																				
#27	H 40B1	<input type="radio"/>	R	CH4 OFFSET Value																				
#28~#29				Reserved																				
#30	H 40B4	<input checked="" type="radio"/>	R	Error status			Data register stores the error status, refer to fault code chart for details.																	
#31	H 40B5	<input type="radio"/>	R/W	Communication address setting			RS-485 communication address. Setting range is 01~255 and factory setting is K1																	
#32	H 40B6	<input type="radio"/>	R/W	Communication baud rate setting			Communication baud rate (4800, 9600, 19200, 38400, 57600 and 115200 bps). b0: 4800 bps (bit/sec). b1: 9600 bps (bit/sec). (factory setting) b2: 19200 bps (bit/sec). b3: 38400 bps (bit/sec). b4: 57600 bps (bit/sec). b5: 115200 bps (bit/sec). b6~b13: Reserved. b14: switch between low bit and high bit of CRC code (only for RTU mode) b15: RTU mode.																	
#33	H 40B7	<input type="radio"/>	R/W	Reset to factory setting			b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0		
				Definition of ERR LED				CH4				CH3				CH2				CH1				
				Example: Setting of CH1 1. b0 Reserved 2. b1 Reserved 3. b2: Set to 1 and PLC will be reset to factory settings. Definition of ERR LED: b12~b15=1111(factory settings) 1. b12 corresponds to CH1: when b12=1, scale exceeds the range or external contact has no connection, ERR LED flashes. 2. b13 corresponds to CH2: when b13=1, scale exceeds the range or external contact has no connection, ERR LED flashes. 3. b14 corresponds to CH3: when b14=1, scale exceeds the range or external contact has no connection, ERR LED flashes. 4. b15 corresponds to CH4: when b15=1, scale exceeds the range or external contact has no connection, ERR LED flashes.																				
#34	H 40B4	<input type="radio"/>	R	Software version			Display software version in hexadecimal. Example: H 010A = version 1.0A.																	
#35~#48				System used																				
○ means latched. × means not latched. R means can read data by using FROM instruction or RS-485. W means can write data by using TO instruction or RS-485.																								

Explanation:
1. CR#0: The PLC model type.

